

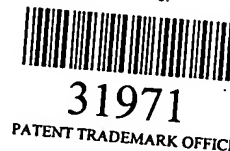
IPW

Docket S-99743  
Customer Number 31971

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In re application of: ) Group Art Unit: 1742  
Girshov et al ) Examiner: Daniel J. Jenkins  
Serial No. 10/672,588 )  
Filing Date: 09/29/2003 )  
Title: Method and Apparatus for Forming )  
Billets from Metallic Chip Scraps )



INFORMATION DISCLOSURE STATEMENT

Honorable Commissioner of Patents  
Washington, D.C. 20231

Sir:

Attached hereto is Form PTO-1449 listing documents believed relevant to the subject application.

It is believed that this disclosure complies with the requirements of 37 C.F.R. §§ 1.56, 1.97 and 1.98 and the Manual of Patent Examining Procedures § 609. If for some reason the examiner considers otherwise, it is respectfully requested that the undersigned be called so that any deficiencies can be remedied.

Some of the Documents may have markings thereon. No significance is meant to be attached to the markings.

These documents are not necessarily analogous art.

The relevance of each document will now be discussed.

Patents

RECEIVED  
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A1. Russian Federation Patent RU 2048268, *Method for Making Deformed Half-Products from Titanium Chips*, (V.L. Girshov, N.P. Petrov), Bull. №32 dated 20 November, 1995.

Before the cold pressing of briquettes, titanium chips are subjected to the operation of vacuum annealing, and after the hot pressing, briquettes are subjected to homogenization.

[No English translation available]

A2. Russian Federation Patent RU 2040367, *Method of Recovery of Metallic Chips* (V.B. Vihkman, A.A. Kosilov, B.I. Lopukhin, A.M. Podpalkin, A.N. Treschevsky), Bull. №21 dated 27 July, 1995.

The hot pressing of briquettes is implemented in vacuum at the temperature equal to the temperature of the titanium chips melting, with simultaneous annealing.

[No English translation available]

A3. Russian Federation Patent RU 2152447, C22B 9/18, published 10 July, 2000, *Process of Electroslag Remelting of Compact Materials*, (Ju A. Filin, V.V. Veter, G.A. Belkin, N.V. Androsoy, N.S. Chvilev, Ju V. Burkov, S.A. Krulevetskiy) discloses:

- the manufacture of blanks from industrial waste (for the most part-from the scrap of copper and its alloys);
- the obtaining of consumable electrodes from the mentioned blanks;
- the above-mentioned blanks or consumable electrodes are subjected to heat treatment;
- the mentioned heat treatment is carried out at 300-600°C during 0.5-4 hours;
- the introduction of flux;
- the melting of the mentioned consumable electrodes;
- the forming of an ingot.

[No English translation available]

A4. Russian Federation patent RU 2081727, published 20 June 1997, *Method of Consumed Titanium and its Alloys Electrodes Production*, (Ju A. Filin, A.S. Barantsev, A.V. Zhil'tsov, V.A. Efimov) discloses:

production of electrodes from titanium wastes.

[No English translation available]

A5. Russian Federation patent RU 2114925, published 10 July 1998, *Method for Manufacture of Consumable Electrodes from Lumpy Metal Wastes*, (I.L. Pushkin, G.V. Bondarenko, A.M. Nadezhin, D.I. Pushkin, G.B. Tserkovskij, D.V. Berezhnoj) discloses:

production of electrodes from metal wastes via electric current welding.

[No English translation available]

A6. Russian Federation patent RU 2148665, published 10 May 2000, *Method of Producing Castings from Noncompact Steel Wastes and Device for Pressing Blocks of Steel Consumable Electrodes for Method Embodiment*, (N.S. Brjunetkin, A.E. Goncharov, A.I. Grishechkin, V.F. Novikov, M.Kh. Spivak, O.G. Fedotov) discloses:

production of electrodes from steel wastes via electroslag remelting and vacuum electric arc furnace remelting

30.

[No English translation available]

A7. U.S. Patent 4,832,760, issued 23 May, 1989, *Method for Refining Microstructures of Prealloyed Titanium Powder Compacts*, (D. Eylon, F. Froes) discloses:

– blanks are subjected to the hydrogenation at 780-1020°C, up to achieving hydrogen content in them about 0.5-1.5 %;

– after the said hydrogenation, blanks are being cooled down to room temperature with the controlled velocity;

– blanks are being heated anew up to 650-750°C in vacuum with the aim of their dehydrogenation with subsequent cooling down to room temperature with the controlled velocity.

Journal Articles

B1. N.F. Anoshkin, *International conference World business and technical prospects of titanium and titanium alloys*, 7-9 December, 1998, c. Atlanta, USA – Tsvetniye metally (Non-ferrous metals), №5, 1999.

High cost of titanium, restricts its application in civil branches of industry.

[No English translation available]

B2. State and titanium world market prospects. – BIKI (Russian abbreviation for “Bulletin of Foreign Commercial Information”), №43 (7778), 9 April, 1998, pp. 14-15.

High cost of titanium, restricts its application in civil branches of industry.

[No English translation available]

B3. A.D. Hartman, S.J. Gerdeman and J.S. Hansen, *Producing lower-cost titanium for automotive applications*, JOM, September 1998, pp. 16-19.

Discussion of the problems of decreasing the cost of titanium semi-finished products for widening the scope of their application.

B4. F.H. Froes, *The production of low-cost titanium powders*, JOM, September 1998, pp. 41-43.

Discussion of the problems of decreasing the cost of titanium semi-finished products for widening the scope of their application.

B5. A.M. Kalinyuk, A.L. Tikhanovsky, N.P. Trigub et al., *Utilization of titanium production waste by the method of electron-beam melting with intermediate tank*.

Problemy SEM (Special Electro-Metallurgy Problems), 1991, №1, pp. 59-63.

The authors suggest the increase of the portion of vacuum remelting scrap aiming for decreasing the cost of titanium semi-finished products.

[No English translation available]

B6. B.E. Paton, B.I. Medovar, V.Ja. Saenko et al., *Obtaining ingots of titanium and its alloys by direct remelting titanium sponge and scrap* – Problemy SEM (Special Electro-Metallurgy Problems), 1995, №3, p. 14-23.

The authors suggest the increase of the portion of vacuum remelting scrap aiming for decreasing the cost of titanium semi-finished products.

[No English translation available]

B7. E.A. Afanasyev, R.I. Burikova, Yu.F. Klimov, V.M. Chupakhin., *Technology development for obtaining ingots from titanium alloy scrap* – Konversiya v machnostroyeni (Conversion in machine-building), 2000, №1, pp. 77-79.

The authors suggest the increase of the portion of vacuum remelting scrap aiming for decreasing the cost of titanium semi-finished products.

[No English translation available]

B8. Visokokachestvenniye izdeliya iz titanovykh splavov poluchenniye metodom press-regeneratsyi iz otkhodov proizvodstva (*High-quality products of titanium alloys obtained by the method of press-regeneration from production waste*), Advert folder “Tantal” (Tantalum), Ufa, 1991.

The technology of the titanium semi-finished product manufacture by briquetting, diffusive welding or pressing in vacuum.

B9. B.A. Kolachev, V.V. Shevchenko, I.D. Nizkin, P.D. Drozdov. *Theoretical ground of pressed-product manufacture from titanium scrap without its remelting*. – Izvestiya Vuzov, Tsvetnaya Metallurgia (University Bulletin, Nonferrous Metallurgy), 1997, №4, pp. 60-65.

The technology of the titanium semi-finished product manufacture by the method of hydrogenation with the subsequent deforming of chips.

[No English translation available]

B10. V.V. Shevchenko, B.A. Kolachev, I.D. Nizkin, V.D. Talalayev, P.D. Drozdov. *Structure and mechanical properties of pressed rods obtained from titanium chips*

*without their remelting.* Izvestiya VUZov, Tsvetnaya Metallurgia (University Bulletin, Nonferrous Metallurgy), 1995, №1, pp. 59-63.]

The manufacture of titanium blanks from chips by extrusion without their remelting.  
[No English translation available]

B11. Yu.A. Filin, A.S. Barantsev, L.T. Kruglov et al. *Reprocessing and utilization of titanium scrap in foundry shops* – Liteinoye proizvodstvo (Foundry), 2000, №7, pp. 21-22.

The application of scrap, including that in the shape of chips briquettes, in the casting production.  
[No English translation available]

B12. M.N. Saubanov, N.B. Panin, A.V. Efimov. *Reprocessing of titanium waste* - Liteinoye proizvodstvo (Foundry), 2000, № 11, p. 19.

The application of titanium chips and their preparation for the secondary using.  
[No English translation available]

B13. A.N. Treschevsky, V.B. Vihman, A.A. Kosylov and al. *Utilization of titanium chips* - Liteinoye proizvodstvo (Foundry), 1993, №9, pp. 20-22.

The using of titanium scrap, including chips, in the secondary alloy melting.  
[No English translation available]

B14. Ur. M. Sigonov. Actual problems of titanium industry – Svetnye Mettaly (Non-ferrous metals), 1995, № 5, pp. 47-50.

The application of large-sized titanium scrap and foundry waste in the production of ingots.  
[No English translation available]

B15. M.M. Johns, Y.A. Kolot, S.O. Scrypnuk, S.P. Kabzystova. Cleaning of titanium alloy chips from surface pollutions by method of jet (spray) processing - Non-ferrous metals. Bull.of STI, N7, 1971, pp. 52-55.

Here are presented the results of chips clearing from superficial contaminants with the use of alkaline solutions, at the temperature 55-70°C during 4 minutes with subsequent washing in hot water (40-55°C) during 2-4 minutes.

[No English translation available]

B16. K.B. Abramova et al, *Briquetting of Titanium Chip Scrap Under the Influence of Electric Current Sharp Pulses*, "Tsevetnye metally", 1998, No. 12, pp. 70-74, discloses:

forming billets from titanium chip scrap comprising steps of cleaning, and cold molding with simultaneous electric current sharp pulses which provide partial diffusion welding of individual chip scrap elements.

[No English translation available]

References by one or more of the inventors:

C1. V.L. Girshov, N.N. Pavlov. *Titanium semi-finished products from chips* (Stand report). 9th World Conference on titanium, 7-11 June, 1999, Saint-Petersburg, Russia.

The results of laboratory experiments that preceded the ISTC Project 717 were presented and discussed in the report. Information of the R.F. Patent 2048268 "Method for Making Deformed Half-Products from Titanium Chips" published 20 November 1995 was also presented.

C2. V.L. Girshov. *Effective technologies of metallic chips reprocessing*.

Materialovedeniye, plasticheskaya i termicheskaya obrabotka metallov. (Physical metallurgy, hot deforming and heat treatment of metals). Materials of Science-and-Practice, Information-Consultation Seminar, 10-11 November, 1999 – Saint-Petersburg, Politechnica, 2000, pp. 40-43.

Two directions of effective regeneration of metallic chips have been considered.

Chips of brittle metallic alloys, e.g. cast iron chips, are recommended to be reprocessed by the method of mechanical grinding with subsequent cold pressing and powder product sintering.

Chips of plastic metallic alloys, e.g. titanium alloy chips, are recommended to be reprocessed according to the following technological scheme: grinding → cleaning → briquetting → encapsulation → hot extrusion.

The results of laboratory experiments on titanium chips reprocessing from research conducted prior to ISTC Project 717 were presented and discussed. [No English translation available]

- C3. V.L. Girshov, A.N. Treschevsky. *Semi-finished products from titanium chips*. – Metalloobrabotka (Metal treatment), 2001, № 2, pp. 42-44.

The technologies of titanium semi-finished product manufacture by the methods of hot extrusion and vacuum-arc remelting of chips briquettes were considered.

The results of chemical analysis and mechanical properties of cast and deformed semi-finished products from research conducted prior to ISTC Project 717 were presented and discussed.

Obtained titanium semi-finished products are illustrated, including ingots and shaped castings, rods and tubes manufactured with the use of industrial equipment.

Preliminary estimation of costs of titanium semi-finished products manufactured from chips was presented. [No English translation available]

- C4. V.L. Girshov, V.I. Putchkov, A.V. Krasovsky. *Producing secondary titanium from chips*. – Metalloobrabotka (Metal treatment), 2001, № 3, pp. 36-40.

Questions related to introduction (implantation) of developed technologies of titanium semi-finished products from chips and the organization of manufacturing of cheap titanium for civil branches of techniques were discussed. [No English translation available]

- C5. Russian Federation Patent Application 2001109063 (English translation), *The Method of Consumable Electrodes Manufacture from Metallic Chips*, (V.L. Girshov, A.M. Podpalkin, A.N. Treschevskiy, A.A. Abramov), filed 28 March, 2001.



C6. Russian Federation Patent RU 2197548 issued for Application 2001109063, *Method of Consumable Electrode Production from Metal Chips*, (V.L. Girshov, A.M. Podpalkin, A.N. Treschevskij, A.A. Abramov), published 27 January 2003. [No English translation available]

C7. Russian Federation Patent Application 2001113682 (English translation), *The Method of Deformed Billets Manufacture from Metallic Chips and the Device for its Implementation*, (V.L. Girshov, A.N. Treschevskiy, V.G. Kochkin, A.A. Abramov, N. S. Sidenko), filed 15 May, 2001.

C8. Russian Federation Patent RU 2201977 issued for Application 2001113682, *Method of Manufacture of Deformed Blanks from Metal Chips and Device for Realization of this Method*, (V.L. Girshov, A.N. Treschevskij, V.G. Kochkin, A.A. Abramov, N.S. Sidenko), published 10 April 2003. [No English translation available]

C9. Project 717 ISTC, *Titanium Recycling*, Final Report, pp. 3 and 6, dated July 22, 2002

#### OTHER INFORMATION

The Applicant wishes to advise the examiner of the following.

References C1-C4 do not disclose any information about the subject invention. The results presented in references C1-C4 arose out of research that preceded ISTC Project 717. The subject invention arose out the work conducted under Project 717.

Aspects of the subject invention were disclosed in references C5(application)/C6 (published patent) and C7(application)/C8(published patent). These do not constitute statutory bars since the present patent application claims the benefit of U.S. Provisional Application # 60/415,800, filed Oct. 4, 2002.

Although references were made to the subject invention in reference C9 (pages 3 and 6), the disclosure is considered non-enabling since no details or process conditions were disclosed.

Respectfully Submitted,

8-9-2004

Date

Randall W. Chang

Randall W. Chang

Registration Number 40,946

**Complete if Known**

*(Use as many sheets as necessary)*

Application Number	10/672,588
Filing Date	09/29/2003
First Named Inventor	Girshov et al
Art Unit	1742
Examiner Name	Daniel J. Jenkins
Attorney Docket Number	S-99743

[illegible]

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> *Number <sup>4</sup> *Kind Code <sup>5</sup> (if known)				
	A1	RU 2048268	11-20-1995	Girshov et al		
	A2	RU 2040367	07-27-1995	Vihkman et al		
	A3	RU 2152447	07-10-2000	Filin et al		
	A4	RU 2081727	06-20-1997	Filin et al		
	A5	RU 2114925	07-10-1998	Pushkin et al		
	A6	RU 2148665	05-10-2000	Brjunetkin et a		

Examiner  
Signature

Date  
Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

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Sheet 2 of 5**NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	B1	N.F. ANOSHKIN, journal Tsvetkiye Metally, No. 5, 1999, Atlanta, U.S., Dec. 7-9, 1998	
	B2	"State and Titanium World Market Prospects", BIKI, No. 43, April 9, 1998, pp. 14-15	
	B3	A.D. HARTMAN ET AL, journal JOM, September 1998, pp. 16-19	
	B4	F.H. FROES, journal JOM, September 1998, pp. 41-43	
	B5	A.M. KALINYUK ET AL, journal Problemy SEM, No. 1, 1991, pp. 59-63	
	B6	B.E. PATON ET AL, journal Problem SEM, No. 3, 1995, pp. 14-23	
	B7	E.A. AFANASYEV ET AL, journal Konversiya v Machnostroyenyi, No. 1, 2000, pp. 77-79	
	B8	Tantal advertisement bulletin, 1991, Ufa, Russian Federation	
	B9	B.A. KILACHEV ET AL, journal Izvestiya Vuzov, Tsvetnaya Metallurgia, No. 4, 1997, pp. 60-65	
	B10	V.V. SHEVCHENKO ET AL, journal Izvestiya Vuzov, Tsvetnaya Metallurgia, No. 1, 1995, pp. 59-63	

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SignatureDate  
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	B11	YU A. FILIN ET AL, journal Liteinoye Proizvodstvo, No. 7, 2000, pp. 21-22	
	B12	M.N. SAUBANOV ET AL, journal Liteinoye Proizvodstvo, No. 11, 2000, p. 19	
	B13	A.N. TRESCHESKY ET AL, journal Liteinoye Proizvodstvo, No. 9, 1993, pp. 20-22	
	B14	UR. M. SIGONOV, journal Svetnye Metally, No. 5, 1995, pp. 47-50	
	B15	M.M. JOHNS ET AL, journal Bulletin of STI, No. 7, 1971, pp. 52-55	
	B16	K.B. ABRAMOVA ET AL, journal Tsvetnye Metally, No. 12, 1998, pp. 70-74	

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	C5	RU 2001109063	03-28-2001	Girshov et al		
	C6	RU 2197548	01-27-2003	Girshov et al		
	C7	RU 2001113682	05-15-2001	Girshov et al		
	C8	RU 2201977	04/10/2003	Girshov et al		

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	C1	V.L. GIRSHOV ET AL, 9th World Conference on Titanium, June 7-11, 1999, St. Petersburg, Russia	
	C2	V.L. GIRSHOV, Materials of Science and Practice Information Consultation Seminar, Nov. 10-11, 1999, St. Petersburg, Russia, journal Politechnica, 2000, pp. 40-43	
	C3	V.L. GIRSHOV ET AL, journal Metalloobrabotka, No. 2, 2001, pp. 42-44	
	C4	V.L. GIRSHOV ET AL, journal Metalloobrabotka, No. 3, 2001, pp. 36-40	
	C9	Project 717 ISTC, Titanium Recycling, Final Report, pp. 3 and 6, dated July 22, 2002	

Examiner Signature	Date Considered
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

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